CLAIMS

1. A nonwoven fabric comprising heat-adhesive composite staple fibers comprising a hot melt-adhesive polymer and a fiber-forming thermoplastic polymer,

wherein:

the hot melt-adhesive polymer forms a portion of the periphery of each composite staple fiber extending along the longitudinal direction of the composite staple fiber, and the fiber-forming thermoplastic polymer forms the remaining portion of each composite staple fiber;

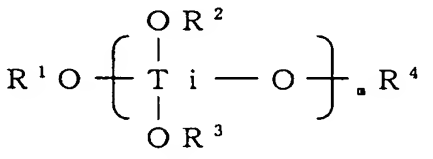
the fiber-forming thermoplastic polymer is selected from polyester polymers produced by polycondensing aromatic dicarboxylate esters in the presence of a catalyst;

the catalyst comprises at least one member selected from mixtures (1) and reaction products (2) as specified below;

the mixture (1) for the catalyst comprises:

(A) titanium compound component comprising at least one member selected from the group consisting of:

(a) titanium alkoxides represented by the general formula (I):

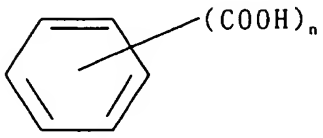


(I)

in which formula (I), R^1, R^2, R^3 and R^4 respectively and independently from each other represent a member selected from alkyl groups having 1 to 20 carbon atoms and a phenyl group, m represents an integer of 1 to 4, and when m represents an integer of 2, 3 or 4, the 2, 3 or 4 R^2s and R^3s may be, respectively, the same as each other or different from each other, and

(b) reaction products of the titanium alkoxides of the general formula (I) with aromatic

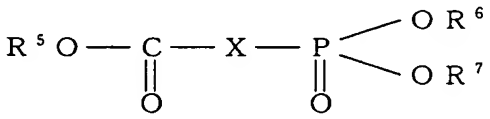
polycarboxylic acids represented by the formula (II):



(II)

in which formula (II), n represents an integer of 2 to 4, or anhydrides of the acids of the formula (II), and

(B) phosphorus compound component comprising at least one phosphorus compound represented by the general formula (III):



(III)

in which formula (III), R^5, R^6 and R^7 respectively and independently from each other represent an alkyl group having 1 to 4 carbon atoms, and X represents a member selected from a $-CH_2-$ group and a -CH(Y)-group (wherein Y represents a phenyl group),

the mixture (1) for the catalyst for the polycondensation being employed in an amount satisfying the requirements represented by the following expressions of relation (i) and (ii):

$$1 \leqq M_p/M_{Ti} \leqq 15 \qquad \text{(i)}$$

and

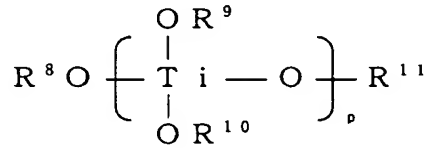
$$10 \leqq M_p + M_{Ti} \leqq 100 \qquad \text{(ii)}$$

wherein M_{Ti} represents a ratio in % of a value in millimole of titanium element contained in the titanium compound component (A) to a value in mole of the aromatic dicarboxylate ester, and M_p represents a ratio in % of a value in millimole of phosphorus element contained in the phosphorus compound component (B) to the value in mole of the aromatic dicarboxylate ester; and

the reaction products (2) for the catalyst comprise: a component (C) reacted with a component (D),

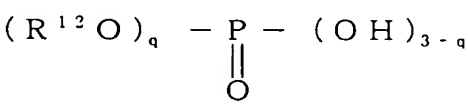
in which reaction products (2), the

component (C) comprises at least one member selected from the group consisting of (c) titanium alkoxides represented by the general formula (IV):



(IV)

in which formula (IV), R^8, R^9, R^{10} and R^{11} respectively and independently from each other represent an alkyl group having 1 to 20 carbon atoms, p represents an integer of 1 to 3, and when p represents an integer of 2 or 3, 2 or 3 R^9s and R^{10}s may be, respectively, the same as each other or different from each other, and (d) reaction products of the titanium alkoxides of the general formula (IV) with aromatic polycarboxylic acids represented by the above-mentioned general formula (II) or anhydride of the acids, and the component (D) comprises at least one phosphorus compound represented by the general formula (V):



(V)

in which formula (V), R^{12} represents an alkyl group having 1 to 20 carbon atoms or an aryl group having 6 to 20 carbon atoms, and q represents an integer of 1 or 2.

2. The polyester composite staple fiber nonwoven fabric as claimed in claim 1 wherein, in each of the component (A) of the mixture (1) and the component (C) of the reaction products (2) for the catalyst, a reaction molar ratio of each of titanium alkoxides (a) and (c) to the aromatic polycarboxylic acid of the general formula (II) or the anhydride thereof is in the range of from 2:1 to 2:5.

3. The polyester composite staple fiber nonwoven fabric as claimed in claim 1 wherein, in the reaction product (2) for the catalyst, a reaction amount ratio of

the component (D) to the component C is in the range of, in terms of ratio (P/Ti) of the molar amount of phosphorus atoms contained in the component (D) to the molar amount of titanium atoms contained in the component (C), from 1:1 to 3:1.

4. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the phosphorus compound of the general formula (V) for the reaction product (2) is selected from monoalkyl phosphates.

5. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the dialkyl aromatic dicarboxylate ester is one produced by a transesterification reaction of a dialkyl ester of an aromatic dicarboxylic acid with an alkylene glycol.

6. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the aromatic dicarboxylic acid is selected from terephthalic acid, 1,2-naphthalenedicarboxylic acid, phthalic acid, isophthalic acid, diphenyldicarboxylic acid and diphenoxyethanedicarboxylic acid, and the alkylene glycol is selected from ethylene glycol, butylene glycol, trimethylene glycol, propylene glycol, neopentyl glycol, hexamethylene glycol and dodecamethylene glycol.

7. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the polyester polymer has an L* value of 77 to 85 and a b* value of 2 to 5, determined in accordance with the L*a*b* color specification of JIS Z 8729.

8. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the composite staple fibers have a side-by-side type structure.

9. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the composite staple fibers have a concentric or eccentric core-in-sheath type structure, the concentric or eccentric core portions of the composite staple fibers comprise the fiber-forming thermoplastic polymer, and the concentric

or eccentric sheath portions of the composite staple fibers comprise the hot melt-adhesive polymer.

10. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the mass ratio of the hot melt-adhesive polymer to the fiber-forming thermoplastic polymer is in the range of from 30:70 to 70:30.

11. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the hot melt-adhesive polymer is selected from polyurethane elastomers, polyester elastomers, non-elastic polyester homopolymers and copolymers, polyolefin homopolymers and copolymers, and polyvinyl alcohol polymers.

12. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the polyester composite staple fibers have an individual fiber thickness of 0.01 to 10 dtex and a fiber length of 5 to 100 mm.

13. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the nonwoven fabric is one produced from the polyester composite staple fibers by a carding method, a paper-forming method or an air-laid method and is then heat treated.

14. The polyester composite staple fiber nonwoven fabric as claimed in claim 13, wherein the nonwoven fabric is subjected to a fiber-interlacing procedure before the heat treatment.

15. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the polyester composite staple fibers are contained in the nonwoven fabric in a content of 25 to 100% by mass on the basis of the nonwoven fabric.

16. The polyester composite staple fiber nonwoven fabric as claimed in claim 1, wherein the polyester composite staple fiber nonwoven fabric is employed in a use in which the nonwoven fabric is brought into contact with food.